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Cereal and Bread Nutrition

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The following is a transcription of the February 1967 issue of Dr. Royal Lee’s *Applied Trophology* newsletter, originally published by Standard Process Laboratories.

On Cereal and Bread Nutrition, Part I

Resolution No. 38. *Bulletin No. 34a, October 1966, International Society for Research on Nutrition and Vital Substances, 12th International Convention on Vital Substances, Nutrition, Civilization Diseases.*

Impending cavities in world nutrition demand a rational utilization of all available food sources, in particular of cereals.

The Scientific Council of the International Society for Research on Nutrition and Vital Substances has pointed out the significance of cereals, especially made of whole meal products, in its resolutions No. 2 and No. 8 on bread and flour (1955). Furthermore, in the 25th resolution on macrobiotics with reference to a diet rich in vital substances and anti-caries foods (1961), also in resolution No. 29, which is concerned with measures to prevent tooth decay (1963), as well as the 30th resolution on the significance of the vegetable food part in the spontaneous resolution No. IV (1964).

Hereby it was pointed out that the basic nutrient of a mixed whole diet, which guarantees for a quantitatively and qualitatively adequate nutrition, should consist of cereals, especially of whole meal.

Already in 1935, the Hygiene-commissions of the League of Nations demanded the limitation of the consumption of white flour (meaning flours of a lower degree of fineness) as well as sugar, and the substitution of one third with cereals made of whole meal products. The 4th International Congress on World Cereals and Bread 1966, which recently took place in Vienna, clearly emphasized this tendency in the nutrition and the necessity of increasing cereal production in favor of whole meal products. Since the appeal of the League of Nations and a number of health organizations showed poor response, the Scientific Council of the International Society for Research on Nutrition and Vital Substances sees its immediate responsibility in renewing concrete demands in respect to whole cereals.

Whole Cereals to Secure World Nutrition

Preliminary alimentary balances of the world’s population and its regions reveal the necessity, not only to double the production of foodstuffs in regard to calories, but also to increase the protein content to three times its present amount.

This could be made possible if fields, which still lie untilled at the present time, are opened up for the cultivation, preferably of cereals, which are subsequently used in the form of whole cereals. This and particularly the consumption of the major cereals—rice, wheat, and corn as porridge and bread made of whole meal— would affect a considerable gain, not only in foodstuffs rich in calories, but also in valuable proteins, fats, mineral substances, and vitamins. The provisional state of people suffering from both a quantitative and qualitative lack of food can thus be improved considerably, especially in view of the fact that more people can be satiated with whole cereals than, as is the case in most countries, with cereals poor of bran, thus being deprived of valuable ingredient substances of the germ and the outer layers. The quantitative gain is illustrated by the fact that up to 25 percent bran, until now, normally discarded as waste, remain intact, thus increasing the satiation value as to time. During the alimentary crises (see both world wars) nearly all countries afflicted by this proved this fact by their raising of the degree of fineness of ground products. Nowadays 30–90 percent of the caloric supply and 25–85 percent of the protein supply is covered by cereals in various regions of the world. As universal average it would amount to 55 percent calories, 70 percent carbon hydrates, 15 percent fat, and 53 percent protein.

Cereal Gran—Flour Body and Envelope

The cereal grain, with its germ rich in vital substances, its outer layers in addition rich in crude fiber, and the caloric content of its white flour core, excels not only in its high content of starch and protein but also in its relatively large variety of vitally important effective substances. This includes almost all the vitamins of the B-groups, vitamin E, important mineral substances and trace elements, unsaturated fatty acids, lipids, phosphatides, etc. Due to their large variety of ingredient substances, whole meal foodstuffs hardly require any compensation. The white flour-core, used in the production of white flour and other foodstuffs (semolina, groats, pastries, starch powder, pudding powder, etc.) has a much lower content of these substances, and, in addition, the biological value of the protein has been diminished.

Cereal Proteins

The protein problem ranks in first place as far as the contemporary nutrition of the world’s population is concerned. Malnutrition, from which one and a half million people suffer, not only indicates caloric deficiency; it should also be considered a lack of proteins. Mainly for this reason a rational, i.e. qualitatively, highly valuable protein utilization of whole cereals is of utmost importance.

The combination of various grain types with one another or with other food proteins can contribute to increase the physiologically useful part of the mixed protein to be attained. The mutual protein revaluation is expressed in the aminograms by numerical changes in the amino acid-content rations and the limiting amino acids. Established examples to this respect are mixtures of cereals with milk, dairy products, nuts, oil seeds, torula yeast protein, alga protein, etc.

Vitamin Carriers

Although avitaminosis like beri-beri are nowadays seldom found in industrial countries, hypo-vitaminoses, particularly of the vitamin B-groups, are widely distributed also in countries with a higher development status. The rejection of whole meal as an important source of vitamin B and the decline in cereal consumption have led to the effect that vitamin B-content, in the normal European diet, has receded to one quarter, compared to that of the past centuries.

Whole meal products contain biological security factors, which are indispensable for the utilization of their starch part. Thus, they contain more than double the amount of vitamin B1 as would be necessary for an uninterrupted, disintegration of their own carbon hydrates. In comparison flours not containing bran are only provided with a small portion of the vitamin B1 quantity required.

When cereals are ground to flours void of bran, when rice is whet and polished to white rice kernels, or when bearded cereals (barley, oats, millets) are skinned, generally, 50 to 90 percent of the vitamins contained in the whole grain are removed. Especially in the case of wheat, it has the result that, in a 60 percent flour free of bran, only relatively small residues remain intact, compared to the whole grain, namely approximately 18 percent vitamin B, 33 percent riboflavin, 17 percent nicotinic acid amide, 35 percent pantothenic acid, 22 percent pyridoxine, 32 percent folic acid, 13 percent biotin, 42 percent tocopherol.

The seven known types of vitamin E (tocopherols) compose a system of equalizing factors of dynamic nature towards the highly unsaturated fatty acids, with whom they are in biological equilibrium.

Mineral Substances

Main and trace elements are abundantly represented in the whole cereal grain and, as it is known so far, they are well resorptive, thus being a valuable contribution to the daily mineral substance supply of human beings. Analogously to a declining vitamin content, their quantity diminishes if the grade of fineness of flours, respectively the grade of skinning or whetting and polishing of bearded cereals are lowered. In wheat flour the following amounts of main elements are contained after being ground to the rate of 60 percent: about 36 percent calcium, 24 percent potassium, 49 percent sodium, 28 percent phosphorous, 17 percent magnesium, and of trace elements approximately 25 percent iron, 40 percent fluorine, 20 to 30 percent zinc and copper, as well as 10 to 20 percent manganese. In corn flour of equal fineness, we only find 70 percent iron, 40 percent magnesium and fluorine, 30 percent phosphoric acid, and iodine as well as 20 percent potassium, manganese, and copper. In polished rice potassium and copper recede to 40 to 50 percent, phosphoric acid and iodine to 20 to 30 percent, magnesium, iron, zinc, and nickel to 10 percent of the amount contained in whole rice.

Ballast Substances

The tissue containing crude fiber in the outer layers of whole cereals is composed of highly polymerized substances with strong water-connective qualities, which are partly or fully indigestible. Their expressed quality of tumefaction contributes to the saturation of the intestines and thus to the physiological stimulation of normal intestinal functions (especially of the intestine peristalsis). Their absence in products not containing bran (white flour, polished rice, etc.) results in a corresponding deficient functioning of normal digestive proceedings.

(See [Part II](#) in the March 1967 issue of *Applied Trophology*.)



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Selene River Press is a publishing company specializing in holistic nutrition education. Our philosophy is rooted in the work of Dr. Royal Lee, who showed that vitamin deficiencies, due to processed foods, are responsible for most degenerative disease. From organic farming to food-based vitamins, from raw milk to fermented foods, Dr. Lee set the course for the field of whole food nutrition.

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